Interagency Ecological Program ~ Cooperative Ecological Investigations since 1970

IEP Science Highlights

(Note: This succeeds the quarterly IEP POD Highlights)

IEP Quarterly Directors Update

Summer 2010

POD Update:

- 2009 FMWT fish indices showed continued low abundances for all POD fish species and record lows for delta smelt and threadfin shad.
- The 2010 POD workplan consists of 43 continuing study elements, 14 new publicly solicited elements (~$2.2 million), and 15 new directed elements (~$1.1 million). Thematically, the elements are broadly distributed across the POD conceptual model.

Highlights from the 2010 Annual IEP Workshop, May 25-26, CSUS:

- The 2-day workshop marked the 40th anniversary of the IEP. It included a panel of 9 IEP Directors, 45 talks and 25 posters on diverse topics, and 284 registered participants.

Some key fish findings:

- *How do delta smelt migrate in winter?* – Pilot study results suggest that delta smelt migrate upstream during high flows and flood tides in the transition zone between deep and shallow channel areas. A full smelt migration study will be carried out next winter.
- *Where are the smelt?* – New sampling found that delta smelt are present in the Sacramento Ship Channel throughout the year. Development of the "SmeltCam," a novel non-lethal fish sampling device is nearing completion. Genetic techniques for discerning the population structure of delta and longfin smelt also show very promising results.
- *What conditions improve smelt survival*? – Field and laboratory results show that longfin smelt larvae can briefly tolerate high salinity, but survive best in low salinity water. They are now successfully raised in the lab. Larval longfin smelt entrainment risk is lowest when San Joaquin River flows are positive and OMR flows are only weakly negative. Delta smelt survival in Clifton Court Forebay is very poor, but good to variable during the SWP fish salvage process (capture, handling, trucking, releasing).
- *How about bass?* – Striped bass is the top pelagic predator in the estuary. High abundance of adult striped bass around the time of the onset of the POD resulted in high consumption of prey fish. Predatory largemouth bass are now also very abundant, but they live in nearshore and vegetated habitats, rarely venture into open water, and prey mostly on sunfish, crayfish, and smaller invertebrates.

Some water quality and food web results:

- *Turbidity dynamics* – Winter flood pulses increase turbidity in the Delta, but sediments get trapped in flooded Delta islands which reduces turbidity.
- *Contaminants* – The majority of contaminant effects on fishes are likely chronic/non-lethal stress or food web effects rather than direct toxicity. Pyrethroid pollution is a particularly big concern. Available data does not allow full quantitative assessment of the role of contaminants in the POD. A consistent monitoring program with new tools that may include genetic "fish health" indicators linked to contaminants is urgently needed.
- *Food web* – Long-term changes in phytoplankton and zooplankton communities coincided with changes in nutrient loads and forms. Vestiges of once abundant native freshwater mussels are still found in and around the Delta.

What's next:

- Summer: IEP's Future Direction and M.O.U. renewal and 2011 IEP core work planning.
- Fall: Independent review of the 2010 POD/HSG workplan and 2011 POD work planning; POD and other IEP sessions at the Bay-Delta Science Conference, Sep. 27-29, 2010.
- Winter: Full delta smelt migration study, 2011 POD work planning.